

Henrico County Emergency Operations Plan Attachment

*Draft Plan for
Pandemic Influenza*

July 24, 2007



I. Purpose

This attachment to the Henrico County Emergency Operations Plan (EOP) addresses how Henrico County plans to prepare for, respond to, and mitigate the threat from pandemic influenza. This document will be periodically reviewed and updated to ensure that information contained within the document is consistent with current knowledge.

II. Situation and Assumptions

For planning purposes, the worst-case scenario is projected. If the situation does not fully develop, the response can be adjusted. The following assumptions are made:

- A. An influenza pandemic will present a massive test of the emergency preparedness system. Advance planning for Henrico County's emergency response could save lives and prevent substantial economic loss.
- B. Although pandemic influenza strains have emerged mostly from areas of Eastern Asia, variants with pandemic potential could emerge in Virginia or elsewhere in the U.S.
- C. Many geographic areas within Virginia and its neighboring jurisdictions may be affected simultaneously. Henrico County should be prepared to rely on our own resources to respond. The effect of influenza on individual communities will be relatively prolonged (weeks to months) in comparison to other types of disasters.
- D. There may be critical shortages of health care resources such as staffed hospital beds, mechanical ventilators, morgue capacity, temporary holding sites with refrigeration for storage of bodies, and other resources.
- E. Healthcare workers and other first responders may be at higher risk of exposure and illness than the general population, further straining the healthcare system.
- F. Widespread illness in the community could increase the likelihood of sudden and potentially significant shortages of personnel in other sectors who provide critical public safety services.
- G. Effective preventive and therapeutic measures (e.g., vaccines and antiviral medications) will be delayed and in short supply.
- H. Assuming that prior influenza vaccination(s) may offer some protection, even against a novel influenza variant, the annual influenza vaccination program, supplemented by pneumococcal vaccination when indicated, will remain a cornerstone of prevention.
- I. Surveillance of influenza disease and virus will provide information critical to an effective response.
- J. It is likely that public health will take the lead in distributing influenza vaccine. Henrico Health Department will work in partnership with health care providers to facilitate distribution.
- K. The vaccine may have to be administered under an Investigational New Drug (IND) protocol.
- L. An effective response to pandemic influenza will require coordinated efforts of a wide variety of organizations, both public and private, and health as well as non-health related.

III. Phases of Pandemic Influenza

The World Health Organization (WHO) has defined phases of pandemic influenza that “address the public health risks of influenza infection in animals, link phase changes directly with changes in public health response, and focus on early events during a ‘pandemic alert’ period when rapid, coordinated global and national actions might help to contain or delay the spread of a new human influenza strain.”² Identification and declaration of the stages outlined in Table 1 will be done at the national or international levels. Refer to Appendices F and G for a listing of activities that will be conducted during each phase of pandemic influenza.

Table 1. Pandemic Influenza Phases and Overarching Public Health Goals

Phase		Definition	Overarching Public Health Goals
Inter-pandemic period	1	No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection is considered to be low.	Strengthen influenza pandemic preparedness at the global, regional, national and subnational levels.
	2	No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk ^a of human disease	Minimize the risk of transmission to humans; detect and report such transmission rapidly if it occurs.
Pandemic alert period	3	Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact. ^b	Ensure rapid characterization of the new virus subtype and early detection, notification and response to additional cases.
	4	Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans. ^b	Contain the new virus within limited foci or delay spread to gain time to implement preparedness measures, including vaccine development.
	5	Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).	Maximize efforts to contain or delay spread, to possibly avert a pandemic, and to gain time to implement pandemic response measures.
Pandemic period	6	Pandemic: increased and sustained transmission in general population. ^b	Minimize the impact of the pandemic.

^a The distinction between Phase 1 and Phase 2 is based on the risk of human infection or disease resulting from circulating strains in animals. The distinction is based on various factors and their relative importance according to current scientific knowledge. Factors may include pathogenicity in animals and humans, occurrence in domesticated animals and livestock or only in wildlife, whether the virus is enzootic or epizootic, geographically localized or widespread, and/or other scientific parameters.

^b The distinction between Phase 3, Phase 4 and Phase 5 is based on an assessment of the risk of a pandemic. Various factors and their relative importance according to current scientific knowledge may be considered. Factors may include rate of transmission, geographical location and spread, severity of illness, presence of genes from human strains (if derived from an animal strain), and/or other scientific parameters.

IV. Flu Pandemic Planning Elements:

The key elements to Flu Pandemic Planning are:

1. Surveillance/Investigation – Detection and identification of a novel influenza virus strain that could potentially cause a pandemic
2. Infection Control – Measures taken to halt the spread of a novel flu virus that has the potential to cause a pandemic. These measures include treatment and prophylaxis using vaccines and antiviral medications and/or isolation of ill and quarantine of exposed contacts.
3. Mitigation – Actions taken, once a pandemic becomes apparent, to reduce the morbidity and mortality in the population, prevent loss of infrastructure and essential services, and reduce economic damage.

4. Public Information – Actions taken to inform the public before, during, and after a pandemic flu event.

IV. Surveillance/Investigation:

Henrico Health Department participates in a statewide surveillance system that is designed to quickly detect outbreaks of disease and identify the organisms involved in order to facilitate early public health intervention. The system has three main components: passive surveillance, active sentinel physician surveillance, and laboratory surveillance. Data on mortality from influenza and pneumonia are also available on a weekly basis through the federal 122 Cities Mortality Reporting System; in Virginia, the cities of Richmond and Norfolk participate in the reporting system.

In the event of an influenza pandemic, additional surveillance activities will be implemented, including: daily monitoring of hospitals for influenza activity, analysis of syndromic surveillance data from participating health systems, review of non-hospital influenza related deaths, collection and analysis of vaccine and antiviral adverse events data, and increased coordination of surveillance activities with neighboring jurisdictions.

Pre-pandemic Influenza Surveillance Activities

Passive Surveillance

The first component of the existing influenza surveillance system, passive surveillance, utilizes influenza information received from physicians, persons in charge of medical care facilities, and directors of laboratories who are required by the *Regulations for Disease Reporting and Control* to report influenza cases in Virginia residents to the health department. Information is reported throughout the year to local health departments and then relayed to the state health department, where it is tabulated weekly and forwarded to the CDC.

Beginning with the 2003-04 influenza season, VDH started conducting enhanced passive surveillance for influenza-associated deaths in persons less than 18 years of age. The goals of this enhanced surveillance are to: monitor and describe the incidence, distribution and basic epidemiologic characteristics of deaths among children related to influenza virus infection; provide data to guide future influenza immunization policy; and to rapidly recognize influenza seasons in which the impact of influenza appears to be unusually severe among children. About 2 pediatric deaths due to influenza per year have been typical of recent flu seasons.

Active Sentinel Physician Surveillance

The second component of the influenza surveillance system is sentinel physician surveillance. Sentinel physicians voluntarily participate in the surveillance system, which is active from October through May of every year. Physicians monitor the number of patients presenting to their offices with influenza-like illness and report the number to the local health department, which relays the information to DSI at the state health department. DSI tabulates data from across the state in order to assess and classify the level of influenza activity (See *Influenza Activity Levels*). Sentinel physicians are distributed geographically among the state's five health-planning regions, assuring that the population under surveillance is spread throughout the state. Each year, prior to the start of the influenza season, Henrico County Health Department recruits private physician practices to serve as local sentinel providers. Baseline incidence levels of disease are established from data collected from the first week in October through the second week in November. Ongoing data collection continues through May of the following year.

On a state-wide level, the VDH goal is at least one sentinel provider per 250,000 persons, per the CDC recommendations. VDH is also evaluating a year-round surveillance program. VDH also participates in the CDC Sentinel Physician Program, where enrolled providers report the number

of patients presenting to their offices with influenza-like illness by age group; providers also report the total number of patients seen at the facility. Data are entered weekly into a secure website maintained by the CDC. Twelve providers participated during the 2004- 2005 influenza season.

Laboratory Surveillance

A third component of the system is laboratory surveillance. The state laboratory identifies strains of influenza virus present in Virginia so that a comparison between the strains present and the vaccine may be made. Information on influenza strains present in the state can also be used to formulate recommendations for antiviral therapy. The laboratory accepts specimens throughout the year, but sentinel physicians are particularly encouraged to send nasopharyngeal and serum specimens for examination, especially in the early and late stages of each influenza season.

Outbreaks

All influenza outbreaks are required to be reported to local health departments within 24 hours. For the 2004-05 influenza season, twenty-five confirmed outbreaks of influenza were reported, most of which occurred at facilities such as nursing homes or assisted living centers. When outbreaks are reported, health departments work with facilities to implement disease control interventions such as: vaccination of unvaccinated individuals; administration of antiviral medications; implementation of infection control precautions; and other interventions as appropriate (e.g., halting facility admissions, cohorting residents/staff, etc.).

122 Cities Mortality Reporting System

Each week, the vital statistics offices of 122 cities across the nation report to CDC the total number of death certificates filed and the number of those for which pneumonia or influenza was listed as the underlying or contributing cause of death. In Virginia, the cities of Richmond and Norfolk participate in the reporting system. CDC publishes the data in its Morbidity and Mortality Weekly Report.

Influenza Activity Levels

The influenza season in Virginia typically runs from the October of one year through March or April of the following year. Data collected through the Sentinel Physician Surveillance System and data from the passive reporting system are tabulated weekly. This information, along with laboratory identification of viral agents, is used to monitor and define influenza activity during the flu season. The numbers do not represent all cases of influenza-like illness seen in Virginia; rather, they allow the health department to monitor the relative levels of activity and to provide the CDC with weekly reports on the status of influenza activity in Virginia. Activity is characterized as no activity, sporadic, local, regional or widespread according to the definitions outlined in Table 2.

Table 2. Influenza Activity Levels

Activity Level	Influenza Like Illness (ILI) Activity/ Outbreaks		Laboratory data
No activity	Low	And	No lab confirmed cases
Sporadic	Not increased*	And	Isolated lab-confirmed cases
	OR		
	Not increased	And	Lab confirmed outbreak in one institution**
Local	Increased ILI in 1 region; ILI activity in other regions is not increased	And	Recent (within the past 3 weeks) lab evidence of influenza in region with increased ILI
	OR		
	2 or more institutional outbreaks (ILI or lab confirmed) in 1 region; ILI activity in other regions is not increased	And	Recent (within the past 3 weeks) lab evidence of influenza in region with the outbreaks; virus activity is no greater than sporadic in other regions
Regional	Increased ILI in 2 regions	And	Recent (within the past 3 weeks) lab confirmed influenza in the affected regions
	OR		
	Institutional outbreaks (ILI or lab confirmed) in ≥ 2 and less than half of the regions	And	Recent (within the past 3 weeks) lab confirmed influenza in the affected regions
Widespread	Increased ILI and/or institutional outbreaks (ILI or lab confirmed) in three or more regions	And	Recent (within the past 3 weeks) lab confirmed influenza in the state.

* Activity is increased when the number of cases reported for an area is three times the activity level during baseline data collection (October through the second week in November).

** Institution includes nursing home, hospital, prison, school, etc.

Pandemic Influenza Surveillance Activities

During a pandemic, in addition to routine surveillance, other activities will be undertaken in order to assess and control the scope of the disease across the state. Key surveillance activities, which will begin during the Pandemic Alert phase and continue through the end of the Second Wave of the pandemic will include:

1. *Monitoring of hospitals for influenza activity.* On a daily basis, the Henrico Health District epidemiology team will be in contact with emergency room staff and infection control practitioners within their jurisdictions to monitor influenza activity levels at hospitals. The number of emergency department visits, hospital admissions, and hospital deaths will be reviewed daily. Henrico Health District epidemiology team will forward the information to the VDH Division of Surveillance and Immunizations (DSI), who will be responsible for statewide planning and coordination of hospital surveillance data.
2. *Analysis of daily syndromic surveillance data for flu-like illness reported from participating health systems across the state.* The Henrico Health District epidemiology team will review syndromic surveillance data daily and investigate increases in reports of influenza-like illness.

3. *Daily review of influenza, pneumonia, or other respiratory infection causes of death from the Office of the Chief Medical Examiner (OCME).* OCME surveillance staff will review influenza related deaths that occur outside of hospitals and report them to DSI, who will share the information with local health districts.
4. *Collection and analysis of vaccine adverse events data.* The Division of Immunization will publicize information and data collection forms for the federal Vaccine Adverse Events Reporting System (VAERS).
5. *Collection and analysis of antiviral adverse events data.* DSI will work with communications staff to establish a telephone-reporting network for reporting of adverse events resulting from use of antiviral medications. Data will be collected, analyzed, and reported to the CDC. Recommendations for use of antiviral medications may be adjusted based on information learned from adverse event data analysis.
6. *Coordination with the VDACS to monitor populations affected by outbreaks of influenza in animals.* If an outbreak of avian influenza is identified in Virginia, DSI will work with VDACS to monitor human populations who are at risk of becoming infected. DSI will work with VDACS to make recommendations for individuals who may be involved in culling operations, including recommendations for appropriate personal protective equipment, disinfection, and surveillance for human illness. DSI will coordinate with VDACS to conduct studies as needed.
7. *Coordination with neighboring jurisdictions.* DSI will work with neighboring states, the District of Columbia and CDC to monitor influenza activity levels in the region. Special studies may be conducted as needed.

Enhanced surveillance measures, as outlined above, will be used to detect pandemic influenza activity levels across the state and to facilitate public health investigation and control interventions. When necessary, DSI may implement additional surveillance measures in order to identify and control the spread of influenza.

V. Infection Control Measures:

During Pandemic Alert Phases 3-5, the goal of infection control efforts will be to prevent sustained human-to-human transmission of a novel flu virus that is capable of triggering a pandemic.

Case/Contact Investigation: Hospitals in Henrico County have agreed to report any cases of persons with flu-like illness and recent travel history (<10 days prior to onset of illness) to areas where the H5N1 strain of Avian flu are known to be present. Upon receiving such a report, the Henrico Health District Epidemiologist will conduct a thorough investigation to include a detailed travel history of the patient, a review of patient's symptoms and lab results, names of other travelers who traveled with the patient, and the names of people who had contact with the patient upon return. The epidemiologist will also arrange for the collection and laboratory analysis of clinical specimens from the patient and contacts of the patient. The VDH Central Region Epidemiologist and VDH DSI are available to provide technical assistance and expertise as required.

Control Measures: During the Pandemic Alert Phases, control measures such as prophylaxis, isolation and quarantine may be effective at halting the spread of a novel flu viral strain. These control measures are designed block further human-to-human transmission of the virus. People who are ill with flu viruses are typically infectious from one day prior to onset of symptoms until

7 days following resolution of symptoms. The incubation period of the virus (the time between infection and the onset of symptoms) can vary from 1 to 10 days. However, there is a lot of variation among flu viruses and human hosts.

Prophylaxis:

Influenza Vaccine:

Henrico Health District routinely monitors the distribution of influenza vaccine during “normal” flu seasons. With few exceptions, there is generally enough vaccine for all Henrico County citizens who want to get the flu shot to get one. Henrico Health District recommends the flu vaccine for all citizens, especially for those at high-risk for severe illness or complications from influenza infection. The groups that are considered high-risk are:

- People 65 years and older;
- People who live in nursing homes and other long-term care facilities that house those with long-term illnesses;
- Adults and children 6 months and older with chronic heart or lung conditions, including asthma;
- Adults and children 6 months and older who needed regular medical care or were in a hospital during the previous year because of a metabolic disease (like diabetes), chronic kidney disease, or weakened immune system (including immune system problems caused by medicines or by infection with human immunodeficiency virus [HIV/AIDS]);
- Children 6 months to 18 years of age who are on long-term aspirin therapy. (Children given aspirin while they have influenza are at risk of Reye syndrome.);
- Women who will be pregnant during the influenza season;
- All children 6 to 23 months of age;
- People with any condition that can compromise respiratory function or the handling of respiratory secretions (that is, a condition that makes it hard to breathe or swallow, such as brain injury or disease, spinal cord injuries, seizure disorders, or other nerve or muscle disorders.)

During a pandemic, an effective vaccine is likely to be in short supply. The CDC and VDH will provide guidance on recommended priority groups for vaccination, as well as for the receipt of antiviral medications. Recommendations for priority groups for vaccination and receipt of antiviral medications will likely be based on: 1. Maintaining the ability to provide quality healthcare, implement pandemic response activities and maintain vital community services; 2. Protecting persons at highest risk for influenza mortality; 3. Decreasing transmission to those at highest risk for influenza mortality; and/or 4. Maintaining other important community services.

Antiviral Medications:

In the United States, four antiviral agents are approved for preventing or treating influenza: amantadine, rimantadine, zanamivir, and oseltamivir. Amantadine and rimantadine are effective against type A influenza only, and are approved by the Food and Drug Administration for influenza A prophylaxis in persons 1 year of age and older. Amantadine is approved for treatment of persons 1 year of age and older; however, rimantadine is approved for treatment of adults only. When administered prophylactically before and throughout an epidemic, both drugs are approximately 70%-90% effective in preventing illness caused by naturally occurring strains of type A influenza virus. When used as prophylaxis, these antiviral agents can prevent illness while permitting sub-clinical infection and the development of protective antibodies against circulating influenza viruses. Therefore, some individuals who take these drugs will develop a protective immune response to circulating influenza viruses.

When used as a treatment, amantadine and rimantadine can reduce the duration of uncomplicated influenza A illness by approximately 1 day, if administered within 2 days of illness onset. To

reduce the emergence of antiviral drug-resistant viruses, amantadine or rimantadine therapy should be discontinued as soon as clinically warranted, typically after 3-5 days of treatment or within 24-48 hours after the disappearance of signs and symptoms. Side effects of both medications can include: nervousness, anxiety, difficulty concentrating, lightheadedness, and insomnia. Central nervous system side effects occur more frequently among persons taking amantadine than among those taking rimantadine.

Zanamivir and oseltamivir are members of a new class of drugs called neuraminidase inhibitors, and are active against both influenza type A and type B. Although not FDA approved for prophylaxis, zanamivir is as effective as oseltamivir for influenza prophylaxis, according to the ACIP. Zanamivir is FDA approved for treatment of uncomplicated acute influenza A or B in persons 7 years of age and older who have been symptomatic for no more than 2 days. Side effects of zanamivir include decreased respiratory function and bronchospasms. It is not recommended for use in individuals with underlying airway disease. Oseltamivir is approved for prophylaxis of influenza infection among persons ≥ 13 years. It is approved for the treatment of uncomplicated influenza A or B in persons 1 year of age and older who have been symptomatic for no more than 2 days. Side effects reported most often in individuals taking oseltamivir include nausea and vomiting. Zanamivir and oseltamivir have been shown to reduce the duration of uncomplicated influenza A and B illness by approximately 1 day. The recommended duration of treatment with either zanamivir or oseltamivir is 5 days.

None of the four antiviral agents has been demonstrated to be effective in preventing serious influenza-related complications such as bacterial or viral pneumonia. It is also important to note that antiviral agents are an adjunct and not a substitute for vaccine. Vaccination remains the principal means for preventing influenza-related morbidity and mortality.

The Advisory Committee of the Health and Medical Subpanel of the Secure Virginia Panel will make recommendations for use of antiviral agents based on availability during an actual pandemic. Table 3 addresses the antiviral agents currently available and their current approved use for prophylaxis and/or treatment.

Table 3. Antiviral Agents for Prophylaxis and Treatment of Influenza

Antiviral Agent	Trade Name	Flu Type	Use	Age Restrictions
Amantadine	Symmetrel®	A	Prophylaxis/Treatment	≥ 1 year
Rimantadine	Flumadine®	A	Prophylaxis/Treatment	Adults only for treatment ≥ 1 year for prophylaxis
Zanamivir	Relenza®	A and B	Treatment only	≥ 7 years
Oseltamivir	Tamiflu®	A and B	Prophylaxis/Treatment	≥ 1 year for treatment ≥ 13 years for prophylaxis

Virginia Antiviral Stockpile: In 2007, the VDH completed a plan to purchase enough Oseltamivir (Tamiflu) to treat up to 25% of the population of Virginia. This medication was purchased for the treatment of ill persons, and not for use as prophylaxis. A plan for distribution through existing pharmaceutical supply chains was also established. Currently, there is no local stockpile of antivirals.

Mass Prophylaxis: Upon assessing the amount of vaccine and/or antivirals available and the size of the priority population, Henrico Health District will determine the best plan for

distribution. Henrico Health District has several plans in place for mass prophylaxis. Depending on the situation, Henrico Health District may use one or more of the following methods:

1. Prophylaxis of exposed contacts: If Henrico Health District is responding to an outbreak of a novel flu virus suspected to be capable of human-to-human transmission, the contacts of the ill patients and the healthcare workers who have treated the ill patients will be given the appropriate vaccine or antiviral medications to prevent further spread of the virus.
2. Mass Vaccination Clinics: Henrico County has a plan in place to conduct mass clinics to prophylax all Henrico County residents in a short period of time (see Smallpox Vaccination Plan).
3. Pharmacy Dispensing Plan: Henrico Health District has agreements in place for local, private pharmacies to distribute vaccines, antibiotics, antivirals, or other prophylactic materials to a large population with limited advanced notice.
4. Hospitals, Jails, Schools, Nursing Homes, and Assisted Living Facilities: Henrico Health District can provide prophylaxis materials to the medical staff of these facilities to provide to their staff and/or patients/residents as required.
5. IVNA & Care-A-Van: The International Visiting Nurses Association (IVNA) and Bon Secours Care-A-Van can establish vaccine clinics throughout the County and also provide home visits. These two groups are especially effective at reaching special needs populations, including the indigent and medically fragile.
6. Use of other healthcare providers: Henrico Health District has plans in place to contact local healthcare providers to obtain cooperation in distributing prophylaxis to priority patients.
7. Prophylaxis for First Responders: Henrico Health District has the ability to establish special clinics (closed to the general public) for first responders or other priority groups.

Isolation & Quarantine:

Isolation: Physical separation of an ill person or persons known to be infected with a Disease of Public Health Threat (DoPHT) from the general population to prevent the spread of the disease. Isolation may be voluntary or compulsory.

Quarantine: Physical separation from the general population of a person or persons who may be infected with a DoPHT but do not show signs of illness. The duration for quarantine is generally one incubation period of the disease in question. Quarantine may be voluntary or compulsory. Quarantine may involve a single person, a group of people, a limited population or a geographic area. Quarantine is limited to the minimum necessary measures required to stop the spread of disease. When appropriate, voluntary quarantine at home is preferred to mandatory quarantine in a quarantine facility.

Isolation & Quarantine Plan for Henrico County: A separate plan that specifically addresses Isolation and Quarantine is currently being drafted and will be included as a separate annex.

Authority

Several sections within the Code of Virginia give the Board of Health and the State Health Commissioner the authority to perform certain acts to protect the health of citizens. Authorities that may be exercised during pandemic influenza are listed in Table 2.

Table 4. Code of Virginia Statute and Corresponding Authority

Statute	Authority
Reporting of Disease	<ul style="list-style-type: none"> Requires reporting of selected diseases to the Board of Health by physicians practicing in Virginia and others, such as those in charge of a medical care

§32.1-35, 36, 37	facility. Immunity from liability for reporting is provided in §32.1-38.
Investigation of Disease , §32.1-39	<ul style="list-style-type: none"> • Authorizes the Board of Health to provide for surveillance and investigation of preventable diseases and epidemics, including contact tracing.
Authority to Examine Records , §32.1-40	<ul style="list-style-type: none"> • Authorizes the Commissioner or his designee to examine medical records in the course of investigation, research or studies. §32.1-41 requires that the anonymity of each patient and practitioner be preserved.
Emergency Orders and Regulations §32.1-13; §32.1-20	<ul style="list-style-type: none"> • Authorizes the Board of Health to make orders and regulations to meet any emergency for the purpose of suppressing nuisances dangerous to public health and communicable, contagious, and infectious diseases and other dangers to public life and health. • Authorizes the Commissioner to act with full authority of the Board of Health when it is not in session.
Disease Control Measures §32.1-42; §32.1-43; §32.1-48	<ul style="list-style-type: none"> • Authorizes the Commissioner to require quarantine, vaccination, or treatment of any individual when he determines it necessary to control the spread of any disease of public health importance. • Permits the Commissioner to require immediate vaccination of all persons in the event of an epidemic.
Isolation of Certain Persons with Communicable Diseases § 32.1-48.02 through §32.1-48.04	<ul style="list-style-type: none"> • Authorizes the Commissioner to order individuals with airborne communicable diseases be taken into custody. • Authorizes the Commissioner to petition for a hearing on temporary detention of individuals infected with a communicable disease. • Provides guidelines for isolation hearings.

VI. Mitigation of Pandemic Flu:

Once a pandemic has begun (Phase 6), it is likely that Henrico County will be affected. It is also likely that there will not be enough vaccine to protect all citizens of the County, or even those at highest risk for severe illness and/or death. It is also unlikely that isolation and quarantine measures will be very effective in controlling the spread of the disease. Therefore, Henrico County should focus its efforts on mitigating the effects of the pandemic on the infrastructure and the economy. It is important to note that for mitigation to be effective, much of the work on mitigation must be done before a pandemic occurs.

Reducing the spread of the virus:

To reduce the spread of a pandemic flu virus, Henrico County should consider the following measures:

- Closure of public schools
- Cancellation of large public gatherings
- Closing or Restricting Entry to County Office Buildings
- Restricting movement of the general population

Prioritization of vaccine and antivirals:

Henrico County should give priority for receipt of vaccine and antivirals to certain groups of people critical to responding to the pandemic and people critical to maintaining the County's infrastructure. These groups may include:

- Emergency Responders (EMS, Fire, Police)
- Hospital Workers
- Public Health Officials
- Public Utilities Workers
- Government Officials

Morbidity and Mortality Projections

The CDC has developed a model for predicting estimates of the impact of deaths, hospitalizations, and outpatient visits due to pandemic influenza. The model was used to develop Henrico County specific estimates of morbidity and mortality from pandemic influenza. Calculations were based on Henrico County population estimates from 2006 U.S. Census Bureau estimated data (estimated population total: 284,479). Twelve weeks of pandemic influenza activity were assumed, with attack rates of 15%, 25% and 35%. While attack rates of a pandemic cannot be predicted with certainty, the range used in the calculations includes the range of attack rates from past pandemics. Gross attack rates reflect the percentages of the population with a case of influenza causing some measurable impact (e.g. work time was lost, patient visited the doctor).

Projected outpatient visits are shown in Table 5 for age group categories across attack rates. The chart shows, for example, that with a 15% attack rate, individuals in the 0-18 year age group would require a total of 7,770 outpatient visits for influenza. The largest number of outpatient visits, 40,327, would occur in the 19-64 year age group, under a 35% attack rate. Outpatient visits were calculated by applying national outpatient visit rates, modeled from past epidemics, to Virginia population data.

The capacity of outpatient services in Henrico County to respond to pandemic influenza was calculated under the following assumptions: 1. In addition to a physician's normal patient load, he could treat five additional pandemic influenza patients per day; and 2. Only primary care physicians, internists, and pediatricians (N=256) in Henrico County would treat influenza cases on an outpatient basis. We were unable to determine estimates of physician assistants, nurse practitioners, and nurses to include in the model; these clinicians will greatly support the medical infrastructure during a pandemic. Under the stated assumptions with a 15% attack rate, outpatient services would be at 22% capacity. Assuming attack rates of 25% and 35%, outpatient services would be at 36% and 51% capacity, respectively. The number of outpatient visits and outpatient visit capacity during a pandemic could differ significantly from our projections. Also, these rates do include the likelihood that residents from neighboring counties will likely receive outpatient services from physician practices in Henrico.

Table 5. Outpatient Visits by Attack Rate

Age Groups (years)	Number of Outpatient Visits		
	15% Attack Rate	25% Attack Rate	35% Attack Rate
0 –18	7,770	12,949	18,129
19 – 64	17,283	28,805	40,327
65+	3,381	5,636	7,891
Total	28,434	47,390	66,347

Projected hospitalizations were calculated using national estimates of predicted hospitalizations during a pandemic, applied to Henrico County population data. Groups at high-risk for complications of influenza infection were considered as a factor in the projections. Table 6 outlines the number of projected hospitalizations by age group and attack rate. It is important to note that during an actual pandemic, both hospitalization rates and the percentage of the population at high-risk for influenza complications could vary significantly from the rates and percentages used to develop these projections.

Table 6. Projected Hospitalizations by Attack Rate

Age Groups (years)	Number of Hospitalizations		
	15% Attack Rate	25% Attack Rate	35% Attack Rate
0 –18	25	41	58
19 – 64	414	690	966
65+	190	317	444
Total	629	1,048	1,467

The impact of pandemic flu on hospitals can be seen in Table 7. During a 12-week outbreak, hospital admissions would peak during week 7. The numbers depicted in Table 7 only examine the impact of Henrico County residents on Henrico County hospitals. These numbers do not include the impact of residents of neighboring counties seeking treatment at the three Henrico County hospitals.

**Table 7. Impact on Hospitals
(Based on a 12-Week Outbreak)**

Pandemic Impact On	Peak Capacity (Week 7)		
	15% Attack Rate	25% Attack Rate	35% Attack Rate
Hospitalizations	8%	14%	19%
ICU Capacity	20%	33%	46%
Ventilator Capacity	9%	15%	21%

Death projections, shown in Table 8, were calculated using national estimates of influenza mortality from past epidemics, applied to Henrico County population data. As shown in Table 7, under a 35% attack rate, up to 333 Henrico residents could lose their lives from pandemic influenza. The number of high-risk individuals in Virginia, based on the current ACIP definition of groups at high-risk for complications of influenza infection, was included as a factor in the projections. During an actual pandemic, both influenza death rates and the high-risk populations could vary significantly from the rates and percentages assumed in the projections.

Table 8. Projected Deaths by Attack Rate

Age Groups (years)	Number of Deaths		
	15% Attack Rate	25% Attack Rate	35% Attack Rate
0 –18	1	3	3
19 – 64	69	117	164
65+	72	119	166
Total	143	238	333

Local Planning Efforts: Henrico County Health Department will take the lead role in community level planning by providing guidance and assistance to County agencies, hospitals, long term care facilities, healthcare providers, businesses, faith-based and community organizations, and other entities with the development of their internal plans. Additionally, Henrico County Health Department will facilitate networking between these entities to ensure that local plans are coordinated and gaps in planning are identified.

Local planning initiatives underway in Henrico include:

- The Health & Medical Advisory Group (HMAG) – the HMAG contains representation from hospitals, nursing homes, assisted living facilities, private physician practices, outpatient treatment centers, pharmacies, home healthcare providers, local businesses, civic organizations, public safety, social services, and local government. The HMAG meets quarterly to discuss local planning issues and concerns.
- Outreach to Long-Term Care Facilities – Henrico County Health Department will conduct outreach visits to nursing homes and assisted living facilities in Henrico County and provide information on infection control, emergency planning and pandemic influenza. Also, Henrico County Health Department maintains a website (www.henricoltcf.org) which serves as a repository of information relevant to long-term care facilities.
- Public Health Bytes newsletter – Henrico County Health Department publishes a monthly newsletter that contains local public health, pandemic influenza, and emergency planning updates. This newsletter is distributed via fax and email to healthcare providers in the community at the end of each month. Also, all past issues and additional resources are available at the following website: www.publichealthbytes.org
- Community Outreach visits and training seminars: The Henrico County Health Department Pandemic Flu Coordinator will conduct training and seminars to businesses, schools, faith-based organizations, government agencies, civic organizations, and other entities to provide pandemic flu preparedness information and materials.
- Local Pandemic Influenza Summits: Henrico County Health Department will conduct at least one local pandemic influenza summit by the end of August, 2007, to provide relevant information to organizations, businesses, and agencies in the community, and to facilitate local networking and planning. Upon completion of the summit, an evaluation of the summit will determine the number and frequency of future summits (if any).

Regional Planning Efforts: Henrico County will continue to work with other jurisdictions in the Richmond Metropolitan Area to enhance regional and state-wide preparedness efforts. Henrico County is a member of the Richmond Metropolitan Medical Response System (MMRS), an organization that includes Richmond, Chesterfield County, Hanover County, and Goochland County that meets on a monthly basis to discuss regional emergency preparedness and response plans.

VII. Public Information: During all phases of the pandemic, a proactive public information campaign is crucial. All messages should be coordinated with the VDH Central Office and with neighboring health districts to ensure a clear, consistent message.

Key communication activities of Henrico Health District will include:

- Identification of two spokespersons for each health district that will be responsible for addressing pandemic influenza related media concerns.
- Distribution of timely and appropriate influenza bulletins to health care providers and community partners.
- Dissemination of information about vaccine availability and distribution plans to community partners.
- Dissemination of the influenza vaccine information sheet to clinic patients and area health care providers.
- Communication of information about groups at high-risk for complications from influenza to health care providers and community partners.

The agency Communications Director will coordinate translation of major public information documents for non-English speaking persons and will also coordinate and arrange for news conferences, as they are needed. Throughout the pre-pandemic period, communications staff will develop risk communications messages for different vaccination scenarios. A draft of potential risk communication messages is located in Appendix A.

Key Public Information Messages:

Pandemic Alert, Phase 3:

- Advocate annual flu vaccination
- Emphasize hand hygiene and “cover your cough” messages
- Emphasize need to stay home from school or work if ill with influenza
- Discourage stockpiling of antiviral medications
- Highlight public health prevention efforts aimed at preventing a pandemic
- Highlight government planning efforts
- Provide up-to-date public health information and education to physicians and other healthcare providers

Pandemic Alert, Phases 4 & 5:

- All of the above, plus:
- Emphasize need for public to comply with voluntary and/or mandatory isolation and quarantine orders (if applicable)
- Provide public with any available information related to vaccination, use of antivirals, etc.
- Provide regular updates to hospitals and outpatient practices on the latest public health alerts and advisories
- Increase collaboration between Health Department, Fire, EMS, Sheriff, Police and other agencies

Pandemic, Phase 6:

- Urge public to reduce their exposure by avoiding large public gatherings
- Hand hygiene and respiratory protection
- Urge public not to stockpile antiviral medications – use only as directed
- Try to reduce the strain on hospitals, emergency departments, and outpatient treatment centers by urging people to stay home unless illness is life-threatening
- Provide media with the latest technical and statistical information, such as viral strain identity and susceptibilities, incubation periods, transmission rates, fatality rates, etc.

VIII. Summary:

An influenza pandemic is not inevitable at this point in time. Efforts aimed at avoiding this scenario have already begun. Currently, we are at Pandemic Phase 3 (Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact). The virus subtype of concern at the present time is the H5N1 Avian flu strain that has infected bird populations in Asia and Europe. This strain has been shown to be very deadly to humans (70-80% mortality rate), but has not shown the ability to spread from person-to-person. It is widely thought by scientists that some mutation in the virus is required for it to make this jump. Public health efforts at the present time are aimed at preventing this change in the virus by culling infected domestic bird populations to reduce the chances of humans coming in contact with the virus. When human cases are detected, measures are taken to prevent the virus from spreading to other humans. These measures include isolation and quarantine, vaccination, and prophylactic use of antivirals.

These public health measures have proven effective so far. However, it is prudent to plan for the worst case scenario – a world-wide pandemic of a novel flu virus that is highly infectious and has a high mortality rate. If this scenario were to occur, Henrico County would have to assume that we could not depend on mutual aid or federal government assistance as all parts of the country would be impacted simultaneously.

The steps listed in this plan address our planning and response efforts to each phase of a potential flu pandemic as they occur. It is important to recognize that prudent efforts can be undertaken at each phase to reduce the likelihood of progression to the next phase. Once a pandemic does occur, Henrico County can take actions to mitigate the impact on the infrastructure, the economy and loss of life.

Appendix A. Draft of Potential Risk Communications Messages

Targeted for Pandemic Influenza

Key messages: 7–9 second sound bites (21 – 27 words)

- Because we are faced with a limited supply of vaccine, it is vital that we look at ways to do the most good for the most people.
- To make sure healthcare providers are available to be there to care for those who develop influenza, it is imperative that we vaccinate healthcare workers immediately.
- To ensure that our community is safe and has water, electricity and other services we all rely on, we must prioritize vaccinating essential services workers.
- *(Fill in age group)*-olds are more seriously affected by this strain of influenza. They are most at risk and, therefore, must be vaccinated early on.
- Although this vaccine has not been approved by the FDA and will be given as an investigational new drug, its benefit far outweighs the associated risks.

Supporting Facts:

- (1) Track case numbers and mortality by age group and by locality.
- (2) Identify groups of essential services workers.
- (3) Develop clear explanations of risks associated with both the disease and the vaccination.

Credible community sources that will validate this key message:

Relationships should be developed with infectious disease specialists in each region of the state now. Agreement should be established that if a pandemic occurs, they will participate in regular conference calls so that we can update them on a regular basis.

**Appendix B. Protocol for the Collection and Submission of Specimens for Isolation
and Identification of Influenza and Other Viruses**
[February, 2004]

DCLS will provide the collection materials and testing services in support of state and federal influenza monitoring and outbreak investigation programs. It also provides collection materials and testing for other viruses as listed in the table below.

Specimen Collection Kits: Isolation kits are prepared by DCLS and may be obtained from the Sample Kit Office at (804) 648-4480 ext.103

Isolation Collection Kit Contents:

1. Sterile Viral Transport Broth (**Refrigerate upon receipt and do not use if turbid.**)
2. One viral collection swab
3. One small sealable specimen bag
4. One set of instructions
5. Absorbent sheet of packing material
6. Metal container or Plastic Pressurized Vessel (**Do not place labels on these containers.**)
7. Large sealable, biohazard plastic shipping bag (8" x 10") [with "Attn: Viral Isolation" label] with pouch
8. Reference request/reporting form (DGS form # -22-164[Rev.1/89])
9. One cold pack (Store frozen so it will be ready for transport.)
10. One Styrofoam cooler and one return address label
11. Pre-paid FedEx mailing label (**Supplied only to the Influenza Program Sentinel Physicians.**)

Nasal Wash collection kit (*sent only by request*)

1. One 5 cc syringe
2. Sterile screw-cap urine cup
3. Sterile Saline

Instructions for Specimen Collection: ISOLATION SPECIMEN SHOULD BE COLLECTED WITHIN 48 HOURS OF ONSET OF ILLNESS. Each isolation kit provides enough material to sample one patient. Collect specimen as close to clinical onset as possible and ship quickly to the lab using provided cooler *and* cold pack. Collection of specimens for a nursing home outbreak should be conducted through the local Health Department. A selective sampling of the most recently ill individuals may be considered in these outbreak scenarios. Appropriate specimens for virus isolation are listed below:

Virus	<i>Optimal Specimen for Collection</i>
Respiratory Viruses (Influenza, Parainfluenzas, Respiratory Syncytial Virus)	Nasopharynx
Adenovirus	Nasopharynx, Rectal swab, Stool, and Conjunctival swab
Herpes Simplex Virus and Varicella Zoster Virus	Mucocutaneous lesion, Conjunctival swab, brain biopsy
Enterovirus	Throat, Rectal swab, Stool (feces), CSF, Heart tissue, Mucocutaneous lesion
Cytomegalovirus	Throat, Biopsy tissue, and Urine

Reference: Manual of Clinical Microbiology, 8th Edition, American Society for Microbiology.

Collection Procedures for Various Specimens:

1. *Nasopharyngeal Wash* (Use only sterile saline to collect wash)

- Obtain collection materials and bring saline to room temperature.
- The patient is instructed to sit with head slightly tilted (70 degree angle) backward and to hold the sterile collection cup.
- Instruct the patient on how to constrict the muscles at the back of the throat by saying “K” sound rapidly and repetitively. Inform the patient that this process may prevent saline from draining down the throat.
- Fill the 5 cc syringe with sterile saline. Gently push the tip of the patient’s nose back with your thumb and quickly inject 1 to 2 cc of saline into each nostril.
- Instruct the patient to contain the saline in the nostril for approximately 10 seconds while repetitively saying the “K” sound. After 10 seconds, ask the patient to tilt his/her head forward and collect the saline in the sterile cup.
- Pour as much of the saline collected from the patient as possible into the vial containing the transport broth, cap and seal tightly.
- Label the tube with the patient’s name and date of collection (use supplied label.) Complete the request form (DGS form # -22-164[Rev.1/89]) and refrigerate the specimen until packaging for transport.

2. *Nasopharyngeal Swab*

- Instruct the patient to sit with head slightly tilted backwards. Gently push the tip of the patient’s nose back with your thumb.
- Insert the nasopharyngeal swab into the nostril back to the nasopharyngeal cavity. The patient’s eyes will momentarily tear. Slowly rotate the swab as it is being withdrawn.
- Repeat this process using the same swab in second nostril again touching the cavity’s back wall.
- Insert the swab into the transport tube bending the wire if necessary to fit completely inside the vial. The broth should cover the tip of the swab in the vial. Tightly cap the vial.
- Label the tube with the patient’s name and date of collection (use supplied label.) Complete the request form (DGS form # -22-164[Rev.1/89]) and refrigerate the specimen until packaging for transport.

3. *Mucocutaneous Lesion*

- Carefully puncture the vesicle to expose the fluid within it with a sterile needle (not provided.)
- Gently blot up the released fluid with the sterile swab.
- Swab vigorously (without producing bleeding) the exposed base of the lesion to remove infected epithelial cells.
- Insert the swab into the transport tube bending it, if necessary, to fit completely inside the vial. Tightly cap the vial.
- Label the tube with the patient’s name and date of collection (use supplied label.) Complete the request form (DGS form# -22-164[Rev.1/89]) and refrigerate the specimen until packaging for transport.

4. *Cerebrospinal Fluid (CSF)*

- Collect approximately 3 to 5 ml of spinal fluid and place in a sterile tube. Tightly cap to prevent leaking in transit.

- Label the tube with the patient's name and date of collection (use supplied label.) Complete the request form (DGS form # -22-164[Rev.1/89]) and refrigerate the specimen until packaging for transport.

5. Stool and Rectal Swab

- Place the feces (about the size of a dime) into a sterile urine cup. If collecting with swab, insert the provided swab 4 to 6 cm. into the patient's rectum. Gently rub the swab against the mucosa to retrieve cellular and fecal material. Place swab into the viral transport vial, cap and seal tightly.
- Label the cup or tube with the patient's name and date of collection (use supplied label.) Complete the request form (DGS form # -22-164[Rev.1/89]) and refrigerate the specimen until packaging for transport.

Instructions for Specimen Transport:

- ❑ Ensure specimens are properly labeled and request forms have been completed before transport.
- ❑ Place labeled specimens in small specimen bag along with absorbent packing material and seal bag; then place in metal container or pressurized vessel and securely screw on lid. Place metal container or pressurized vessel containing the specimen in large biohazard shipping bag. Seal the large shipping bag. Place form in the pocket of the shipping bag.
- ❑ Place bagged specimens in the cooler with frozen cold pack to **keep specimen refrigerated** (increases chance of viral recovery,) seal cooler for shipment to lab and affix correct address label to cooler.
- ❑ Ship specimens without delay. **SPECIMENS MUST BE DELIVERED TO THE LABORATORY WITHIN 72 HOURS OF COLLECTION.**
- ❑ Each shipment of specimens from a submitter must comply with shipping regulations detailed in IATA 1.5 and 49 CFR Section 1720700 [U.S. Department of Transportation.]
- ❑ Send specimens to lab by courier or Federal Express. Use the following address on all packages:

*Department of General Services
Division of Consolidated Laboratory Services
Specimen Receiving, Room 155
600 North 5th Street
Richmond, VA 23219-3691
ATTN: Viral Isolation*

Result Reporting: Routine monitoring results are mailed to submitter and the Office of Epidemiology. When alerted of a medical emergency or an outbreak, results will be telephoned to the submitter and to the Office of Epidemiology if a reporting telephone number was provided.

Specimen Rejection: Specimens that exceed holding time, specimens not labeled or incorrectly labeled, specimens with insufficient volume, or specimens collected in isolation kits not supplied by DCLS will be rejected.

Requests for Additional Information or Specimen Collection Questions: For additional information or questions, please call (804) 648-4480 ext. 272. To order collection kits, please call (804) 648-4480 ext. 103.

Appendix C. Influenza Antivirals: Overview for Healthcare Providers

<p>Amantadine</p> <p>Manufactured under the trade name Symmetrel® by Endo Laboratories</p> <p>Also available in generic forms</p>	<ul style="list-style-type: none"> • Used to treat uncomplicated illnesses due to influenza A in individuals 1 year of age and older (must be given within two days of illness onset) • Used prophylactically to reduce chance of getting influenza A in individuals 1 year of age and older (approximately 70%-90% effective) • Also used in the treatment of Parkinson's disease and drug-induced extrapyramidal reactions • Available in tablet or syrup form • Adverse reactions reported most frequently include nervousness, anxiety, difficulty concentrating, lightheadedness and insomnia • More serious but less frequent side effects including behavioral changes, delirium, hallucinations, agitation, and seizures have been observed among individuals with renal insufficiency, seizure disorders, or certain psychiatric disorders • Should not be used for patients with untreated angle closure glaucoma because of anticholinergic effects • To reduce the emergence of antiviral drug-resistant viruses, amantadine therapy for treatment of influenza should be discontinued as soon as clinically warranted, typically after 3-5 days of treatment or within 24-48 hours after disappearance of signs and symptoms
<p>Rimantadine</p> <p>Manufactured under the trade name Flumadine® by Forest Laboratories</p> <p>Also available in generic forms</p>	<ul style="list-style-type: none"> • Used to treat uncomplicated illnesses due to influenza A in adults (must be given within two days of illness onset) • Used prophylactically to reduce chance of getting influenza in individuals 1 year of age and older (approximately 70%-90% effective) • Available in tablet or syrup form • Adverse events reported most frequently include nervousness, anxiety, difficulty concentrating, lightheadedness, and insomnia. • More serious but less frequent side effects including behavioral changes, delirium, hallucinations, agitation, and seizures have been observed among individuals with renal insufficiency, seizure disorders, or certain psychiatric disorders • To reduce the emergence of antiviral drug-resistant viruses, rimantadine therapy for treatment of influenza should be discontinued as soon as clinically warranted, typically after 3-5 days of treatment or within 24-48 hours after disappearance of signs and symptoms
<p>Zanamivir</p> <p>Manufactured under the trade name Relenza® by GlaxoSmithKline</p>	<ul style="list-style-type: none"> • Used to treat uncomplicated illnesses due to influenza A and B in individuals 7 years of age and older (must be given within two days of illness onset) • Not used to prevent the flu or to decrease the risk of transmitting the virus to others • Available as a dry powder, inhaled twice a day from a breath-activated plastic device called a Diskhaler • Some patients, especially those with asthma or chronic obstructive pulmonary disease (COPD), have had bronchospasms or serious breathing problems after using zanamivir • Zanamivir is not recommended for patients with underlying airway disease; if physicians prescribe it after careful consideration of risks and benefits, the drug should be prescribed under careful monitoring and supportive care, including the availability of fast acting bronchodilators. • Side effects, in addition to bronchospasms, may include headache, diarrhea, nausea, bronchitis, cough, sinus inflammation, infections of the ear, nose, and throat, and dizziness. • Recommended duration of treatment is 5 days
<p>Oseltamivir</p> <p>Manufactured under the trade name Tamiflu® by Hoffman-LaRoche, Inc.</p>	<ul style="list-style-type: none"> • Used to treat uncomplicated illnesses due to influenza A and B in individuals 1 year of age and older (must have been given within two days of illness onset) • Used prophylactically to reduce the chance of getting influenza in persons 13 years of age and older (approximately 70%-90% effective) • Available in capsule or oral suspension form • Possible side effects include nausea and vomiting. Side effects are similar whether oseltamivir is taken for treatment or prophylaxis • Recommended duration of treatment is 5 days

Appendix D. Recommendations for Use of Antivirals

Chemoprophylaxis is not a substitute for vaccination. However, in the event of an influenza pandemic, vaccine may not be available, or may only be available in limited quantities.

In the United States, four antiviral agents are approved for preventing influenza: amantadine, rimantadine, zanamivir, and oseltamivir. All of the agents, except for zanamivir, are also approved for prophylactic use. Some important points about influenza antiviral medications are:

- ❑ Benefits of using antiviral agents in the treatment of influenza are limited.
- ❑ When administered within two days of illness onset, antivirals may reduce duration of uncomplicated influenza illness by approximately 1 day.
- ❑ None of the four antiviral agents have been demonstrated to be effective in preventing serious influenza-related complications such as bacterial or viral pneumonia.
- ❑ Death from influenza is much more likely to occur in the event of a serious influenza-related complication, especially among high-risk individuals. Preventing influenza rather than attempting to shorten the duration of illness can achieve maximum benefit. Therefore, in the event of an influenza pandemic, use of antivirals (excluding zanamivir) should be prioritized for prophylactic rather than treatment purposes.

Recommendations for chemoprophylaxis are provided primarily to help health care-providers make decisions regarding persons who are at greatest risk of severe illness and complications from influenza. Prophylactic use of antivirals should be considered for the following groups:

1. Individuals targeted to receive vaccine who cannot be vaccinated due to anaphylactic hypersensitivity to eggs or other components of the influenza vaccine or individuals with a history of Guillain-Barre' syndrome
2. Unvaccinated persons aged ≥ 65 years of age
3. Unvaccinated residents of nursing homes and other chronic-care facilities that house individuals of any age with chronic medical conditions
4. Unvaccinated adults and children who have chronic disorders of the pulmonary or cardiovascular systems, including children with asthma
5. Unvaccinated adults and children who have required regular medical follow-up or hospitalization during the preceding year because of chronic metabolic diseases (including diabetes mellitus), renal dysfunction, hemoglobinopathies, or immunosuppression caused by medications or by human immunodeficiency virus
6. Unvaccinated children and adolescents (aged 6 months-18 years) who are receiving long-term aspirin therapy and therefore, may be at risk of developing Reye syndrome after influenza infection
7. Unvaccinated employees of nursing homes, chronic-care facilities, and assisted living residences who have contact with patients or residents

8. Unvaccinated individuals who provide home care to persons at high-risk
9. Unvaccinated household members (including children) of persons at high-risk

Pregnant Women

Although pregnant women who will be in the second or third trimester of pregnancy during influenza season are recommended for vaccination, this group is not recommended for routine antiviral treatment. No clinical studies have been conducted regarding the safety and efficacy of amantadine, rimantadine, zanamivir, or oseltamivir for pregnant women. However, both amantadine and rimantadine have been demonstrated in animal studies to be teratogenic and embryotoxic when administered at very high doses. Because of the unknown effects of influenza antiviral drugs on pregnant women and their fetuses, these four drugs should be used during pregnancy only if the potential benefit justifies the potential risk to the embryo or fetus.

Drug Resistance

To limit the potential transmission of drug-resistant virus during institutional outbreaks, measures should be taken to reduce contact as much as possible between persons taking antiviral drugs for treatment and other persons, including those taking the same drugs for chemoprophylaxis.

Combination of Antiviral Medications

No published data are available concerning the safety or efficacy of using combinations of any of these four influenza antiviral drugs. For more detailed information concerning potential drug interactions for any of these influenza antiviral drugs, the package insert should be consulted.

It is important to be aware of persons already taking one of these medications for another purpose so that they will not be prescribed an additional amount, and thus receive too large a dose of the drug.

Information in Appendix D, excluding the nine recommendations for chemoprophylaxis, was taken from:

Centers for Disease Control and Prevention. Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices. MMWR 2003; 52 (RR08): 1-36.

Appendix E. References

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4. Meltzer MI, Cox NJ, Fukuda K. The Economic Impact of Pandemic Influenza in the United States: Priorities for Intervention. Emerging Infectious Diseases. Vol 5, No 5, September-October 1999.
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